

ASSIGNMENT 2

Textbook Assignment: "Aircraft Construction and Materials," chapter 1, pages 1-24 through 1-44.

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| <p>2-1. The amount of cold-working a metal can withstand is directly related to which of the following properties?</p> <ol style="list-style-type: none">1. Density and elasticity2. Toughness and fusibility3. Malleability and ductility4. Contraction, expansion, and conductivity <p>2-2. When all other metal properties are equal, what method of joining metals structurally has the greatest advantage in design and fabrication?</p> <ol style="list-style-type: none">1. Welding2. Brazing3. Riveting4. Soldering <p>2-3. What are the three basic methods of metal working?</p> <ol style="list-style-type: none">1. Cold-working, hot-working, and forging2. Hot-working, cold-working, and rolling3. Hot-working, cold-working, and extruding4. Cold-working, hot-working, and hot-rolling <p>2-4. The intermediate shape of steel that has width greater than twice the thickness and from which sheets are rolled is known by what name?</p> <ol style="list-style-type: none">1. Slab2. Bloom3. Ingot4. Billet <p>2-5. What method of metal working will give the best possible structure throughout the metal?</p> <ol style="list-style-type: none">1. Pressing2. Extruding3. Cold-rolling4. Smith forging | <p>2-6. What effect does cold-working have upon the ductility, elasticity, and hardness of a metal?</p> <ol style="list-style-type: none">1. All are decreased2. All are increased3. Ductility is decreased; elasticity and hardness are increased4. Ductility and elasticity are increased; hardness is decreased <p>2-7. What metal working process is used to make wire?</p> <ol style="list-style-type: none">1. Pressing2. Extruding3. Hammering4. Cold-drawing <p>2-8. The process of dipping steel in an acid to remove scale is known by what name?</p> <ol style="list-style-type: none">1. Pickling2. Tempering3. Quenching4. Annealing <p>2-9. Which of the following aircraft parts are made by the extrusion process?</p> <ol style="list-style-type: none">1. Cables2. Stringers3. Control rods4. Seamed tubing <p>2-10. An alloying agent can change which of the following base metal characteristics?</p> <ol style="list-style-type: none">1. Strength2. Corrosion resistance3. Electrical conductivity4. All of the above <p>2-11. A ferrous metal has what type of metal as its principal component?</p> <ol style="list-style-type: none">1. Lead2. Iron3. Nickel4. Aluminum |
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IN ANSWERING QUESTION 2-12, REFER TO TABLE 1-1 IN THE TEXTBOOK.

- 2-12. What is the type and composition of SAE 5135 steel?
1. Nickel steel, 5-percent nickel and 13.5-percent carbon
 2. Chromium steel, 1-percent chromium and 0.35-percent carbon
 3. Chromium steel, 13-percent carbon and 0.5-percent chromium
 4. Nickel steel, 5-percent steel, 1-percent nickel, and 0.35-percent carbon
- 2-13. While holding a piece of metal against a revolving stone, you see red sparks leave the stone and turn to straw color. This is what type of metal?
1. Low-carbon steel
 2. Nickel steel
 3. Wrought iron
 4. Cast iron

IN ANSWERING QUESTIONS 2-14 THROUGH 2-17, SELECT FROM COLUMN B THE TYPE OF STEEL USED IN THE ITEM LISTED IN COLUMN A.

A. ITEMS	B, TYPES OF STEEL
2-14. Bolts	1. Nickel steel
2-15. Safety wire	2. Chromium steel
2-16. Coil springs	3. Low-carbon steel
2-17. Antifriction ball bearings	4. High-carbon steel

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- 2-18. What is the prime characteristic of aluminum?
1. Lightweight
 2. Low melting point
 3. Ease of fabrication
 4. Corrosion-resistant properties
- 2-19. Which of the following processes of joining aluminum alloys produces the strongest joints?
1. Brazing
 2. Forging
 3. Riveting
 4. Heat treating

- 2-20. Which of the following statements is correct concerning an aluminum sheet designated 1075?
1. It is 99.75 percent aluminum
 2. It contains 0.75 percent carbon
 3. It is alloyed with nickel
 4. It is pure aluminum with a modification in impurities

IN ANSWERING QUESTIONS 2-21 AND 2-22, REFER TO TABLE 1-2 IN THE TEXTBOOK.

- 2-21. What is the principal alloying element of aluminum alloy 2024?
1. Zinc
 2. Copper
 3. Manganese
 4. Magnesium
- 2-22. An aluminum alloy containing manganese as the major alloying element is identified by what number?
1. 1035
 2. 2014
 3. 3003
 4. 7010
- 2-23. An aluminum alloy that is fully heat treated will have what letter designation?
1. F
 2. H
 3. O
 4. T
- 2-24. Which of the following aluminum alloys should be used when the highest strength is required?
1. 1100
 2. 2014
 3. 5052
 4. 7178
- 2-25. Alclad is an aluminum alloy with a protective coating of what material?
1. Manganese
 2. Pure aluminum
 3. Zinc chromate
 4. Aluminum oxide
- 2-26. In the aluminum alloy designation A355-T51, what does the prefix A indicate?
1. The heat treatment
 2. The type of casting
 3. The composition of the casting
 4. The original alloy composition was varied slightly

- 2-27. What methods are used to join heat-treatable aluminum alloys?
1. All welding methods
 2. Spot welding and riveting only
 3. Fusion welding and bolting only
 4. Spot welding, fusion welding, riveting, and bolting
- 2-28. What is the greatest disadvantage in the use of titanium?
1. Strength-to-weight ratio
 2. Tendency to crack when cold-worked
 3. Tendency to back away from or resist the cutting edge of tools
 4. Brittleness after long exposure to temperatures above 1000°F
- 2-29. If you hold a piece of titanium against a revolving grinding wheel, what color sparks will be produced?
1. Red spark traces that end in straw colored bursts
 2. White spark traces that end in straw colored bursts
 3. Red spark traces that end in brilliant white bursts
 4. White spark traces that end in brilliant white bursts
- 2-30. The use of copper as a structural material is limited because of which of the following factors?
1. Cost
 2. Great weight
 3. High heat conductivity
 4. High electrical conductivity
- 2-31. Because copper is very ductile and malleable, it is ideal for making electrical wire.
1. True
 2. False
- 2-32. What is the principal element added to copper to form brass?
1. Tin
 2. Lead
 3. Zinc
 4. Aluminum
- 2-33. Which of the following bronze alloys has high strength and great corrosion resistance but is NOT a true bronze because it contains a small amount of tin?
1. Silicon bronze
 2. Manganese bronze
 3. Cast aluminum bronze
 4. Wrought aluminum bronze
- 2-34. Which of the following statements regarding Monel is NOT correct?
1. Monel is classified among the tough metals
 2. Monel's base metal is nickel and its principal alloying element is copper
 3. Monel's tensile strength can be increased to a great degree by heat treatment
 4. Monel is used for aircraft parts demanding both strength and resistance to corrosion
- 2-35. If a block of aluminum weighs 6 pounds, a block of magnesium having the same dimensions would be what weight?
1. 6 pounds
 2. 2 pounds
 3. 8 pounds
 4. 4 pounds
- 2-36. One of the major problems with using magnesium in aircraft construction is its short supply in the world.
1. True
 2. False
- 2-37. Which of the following extinguishing agents should be used on a magnesium fire?
1. Graphite powder
 2. Carbon dioxide
 3. Water
 4. Foam
- IN ANSWERING QUESTION 2-38, REFER TO TABLE 1-3 IN THE TEXTBOOK.
- 2-38. You are testing a piece of steel on the Brinell tester and find the diameter of the ball impression to be 2.35 mm. What is the hardness number for this material?
1. 114
 2. 124
 3. 682
 4. 745
- 2-39. Which of the following penetrators are used with the Rockwell hardness tester?
1. Flanged head and truncated cone
 2. Spiral point and steel ball
 3. Diamond cone and steel ball
 4. Diamond tip and spiral rod

IN ANSWERING QUESTIONS 2-40 THROUGH 2-42, REFER TO TABLE 1-4 IN THE TEXTBOOK.

2-40. You are testing a piece of steel on the Rockwell tester using the diamond penetrator and both weights. If the reading is 40 on the black scale and 70 on the red scale, what is the hardness number?

1. C-40
2. C-70
3. D-40
4. D-70

2-41. When the Rockwell hardness tester is being used, the black dial numbers should be read only when what scale or penetrator is used?

1. E scale
2. F scale
3. Diamond penetrator
4. 1/16-inch ball penetrator

2-42. In what way should the pan be weighed when making a G scale test on the Rockwell hardness tester?

1. With the red weight only
2. With the black weight only
3. With both the red and black weights
4. Without either the red or black weight

2-43. When testing a metal of completely unknown hardness on a Riehle hardness tester, a preliminary reading should be taken on what scale as a guide in selecting the proper scale to be used?

1. A
2. B
3. F
4. G

IN ANSWERING QUESTION 2-44, REFER TO TABLE 1-5 IN THE TEXTBOOK.

2-44. Which of the following aluminum alloys is the hardest?

1. 3003-0
2. 3003-1/2H
3. 5052-1/2H
4. 6061-T

2-45. You check the condition of the point of the Barcol tester by using the test disc and find the indicator reading is NOT within the specified range. You should correct this condition by first following what procedure?

1. Grind the point
2. Install a new point
3. Adjust the lower plunger guide
4. Adjust the plunger upper guide nut

2-46. When an Ernst hardness tester is used, a direct reading from which of the following scales should NOT be used?

1. Brinell scales
2. Rockwell A scale
3. Rockwell B scale
4. Rockwell C scale

2-47. The canopies of most high-speed naval aircraft are made of what material?

1. Stretched acrylic plastic
2. Laminated acrylic plastic
3. Laminated thermoplastic
4. Thermoshield

2-48. When viewed from its edge, which of the following plastics is practically clear?

1. Heat-resistant acrylic
2. Craze-resistant acrylic
3. Thermosetting polyester
4. Heat-resistant polyester

2-49. You can distinguish a plastic enclosure from a glass enclosure by using which of the following methods?

1. Checking for a nonringing sound while tapping lightly
2. Checking the ease with which it is drilled
3. Checking its reaction to acetone
4. Checking its reaction to hexane

- 2-50. Relative to handling and storage of sheets of plastic, which of the following statements is NOT correct?
1. Plastic sheets should be stored in bins that are tilted away from the vertical
 2. Plastic sheets should be stored in a cool, ventilated area in order to reduce the potential fire hazard
 3. If the plastic sheets are stored horizontally, the smaller sheets should be stacked upon the larger ones
 4. If the plastic sheets are placed on a table prior to shaping, the table must be cleaned thoroughly
- 2-51. If long or improper storage has caused the adhesive to deteriorate on a sheet of plastic, the masking paper should be moistened with what chemical?
1. Ether
 2. Xylene
 3. Glass cleaner
 4. Aliphatic naphtha
- 2-52. What primary characteristic makes reinforced plastic a particularly ideal material from which to construct radomes?
1. Dielectric property
 2. Ease of fabrication
 3. High strength/weight ratio
 4. Resistance to mildew and rot
- 2-53. Which of the following resins are thick, syrupy liquids used in the manufacture of reinforced plastic?
1. Pressure resin
 2. Heat-pressure resin
 3. Contact-pressure resin
 4. Noncontact-pressure resin
- 2-54. In various aircraft structural components, which of the following materials is replacing and supplementing metallic materials?
1. Rubber material
 2. Plastic material
 3. Sandwich material
 4. Composite material
- 2-55. Numerous combinations of composite materials are being studied and used, but because of cost, the trend is toward a minimum use of which of the following materials?
1. Boron/epoxy
 2. Kevlar®/epoxy
 3. Aluminum/epoxy
 4. Graphite/epoxy
- 2-56. Advanced composites have given composite materials structural properties superior to the metal alloys they have replaced?
1. True
 2. False
- 2-57. What are the two broad classes of sandwich components?
1. Radomes and doors
 2. Stabilizer and radomes
 3. Radomes and structural
 4. Stabilizer and trim tabs